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FAA AVIATION NEWS

FEBRUARY 1967

COVER

STOL aircraft, as well as helicopters, operated deep into the heart of Manhattan to provide "relief" to "stricken" New Yorkers during a recent exercise. (See page 10.)

FAA AVIATION NEWS

FEDERAL AVIATION AGENCY VOL. 5, NO. 10

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William F. McKee, *Administrator*
David D. Thomas, *Deputy Administrator*

Charles G. Warnick, *Director*, Office of Information Services;
Donald R. Foxvog, *Editor;* Abner B. Cohen, *Art Director*

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Veteran pilot Henry S. Hubbell, Jr., chief of the General Aviation Operations Branch, prepares for flying field trip.

FAA Spokesman Foresees

Pilot Testing by Private Agencies

The FAA foresees the time when instructors and private pilot training agencies will have "full responsibility" to both train and test all private pilots.

Henry S. Hubbell, Jr., chief of the General Aviation Operations Branch in FAA's Flight Standards Service, said that "within a very few years it will not be feasible or possible" for the FAA itself to test all pilot applicants individually.

Addressing a high-level meeting in Toronto last fall, Hubbell said this procedure, "with proper surveillance," would result in safer pilots.

Hubbell also made these points:

- The safety problem will provide a common bond to pull all segments of general aviation closer together.
- In the future there will be a "true cause analysis of accidents" in terms of human emotional and behavior factors.
- Aircraft and the air environment will be improved.

The Toronto aviation safety meeting addressed by Hubbell was sponsored by the Canadian Aeronautics and Space Institute, American Institute of Aeronautics and Astronautics and Cornell Guggenheim Aviation Safety Center.

Hubbell pointed out to these groups that in the early days of civil aviation, "major efforts were devoted to developing safety regulations and organizations to enforce the rules."

Hubbell explained that following the 1946-1953 post war general aviation boom, there was a civil aviation recession "caused in part by the cutback in Government financial aid for flight training for veterans and by a mild, general recession in the United States.

"During these years," he said, "we saw much effort directed to general aviation safety, and to development of regulations to more or less enforce safety improvement. In the years that followed we witnessed signs of a sobering maturity in general aviation, a trend toward consolidating and stabilizing our gains. Both industry and Government were becoming aware that general aviation was no longer predominantly a sport flying activity, but blossoming into a transportation industry. . . . We had seen general aviation grow from lone eagles, barnstormers and wing walkers to mature businessmen dealing with manufacturing, sales, training and management of fixed-base operations."

Hubbell said that while the nature of aviation "attracted the strong, self-reliant individualist who in many cases was reluctant to take advice or be regulated," general aviation has assumed greater responsibility and given greater attention to safety. He said "the future of general aviation safety" is "indeed bright—certainly bright from the technological side."

"Today," he said, "both Government and industry are encouraging built-in devices to prevent common accidents. Stability augmentation systems, automatic landing gear systems, stall warning devices, stick pushers and angle of attack indicators are but a few of the many safety devices appearing in modern aircraft."

Hubbell plugged for the wearing of effective shoulder harnesses and discussed both present and future achievements that relate to the pilot-aircraft environment.

"But as we look at these new developments," Hubbell said, ". . . there is one glaring void—we have neglected the airman!"

Emphasizing FAA's present concern with airman training and certification standards and methods, Hubbell pointed up the fact that there has been a 12 per cent average annual increase in the number of pilot certificates issued since World War II. But in the past year, the number of new student pilot certificates jumped 50 per cent—to 110,000 from the 70,000 issued the year before. He said this appeared to confirm industry forecasts of 300,000 new student pilots annually by 1970. *(Speech excerpts, page 4)*

Hubbell Looks Into the Future:

Industry and government became aware that general aviation was no longer predominantly a sport flying activity.

The FAA and its predecessor agency, the Civil Aeronautics Administration, has at times taken a paternalistic approach to pilot qualification by specifying the hours of training required, the solo experience and even the flight maneuvers to be practiced. It has provided written examinations and flight tests of all pilot certificate applicants by its own inspectors or qualified examiners personally designated to represent the Administrator.

We foresee that such regimentation of training and individual testing of all pilot applicants will not be feasible or possible within a very few years. It is now unrealistic to try to evaluate pilot performance on the basis of a few practiced maneuvers and it will soon be impracticable for the FAA to provide examinations and flight tests for all pilot applicants.

Specified flight hours and specified flight maneuvers are no longer a reliable index of a pilot's capabilities in the complex environment of modern flight operations. Operational training and qualification is necessary if the pilot is to perform efficiently and safely. The agency or instructor who trains a pilot is undoubtedly in a better position to determine the operational training he needs, and the competency he has achieved, than is someone else who merely evaluates the pilot's compliance with minimum aeronautical experience and flight maneuver performance standards. We suggest that it may be possible and preferable to develop pilot training agencies and instructors with unquestioned qualifications and sense of responsibility. We might well assign full responsibility to them for the training and qualification of all private pilots.

We believe that such a procedure would be in keeping with the maturing general aviation industry and, with proper surveillance of performance standards, would result in more competent and safer pilots.

Let's look at the future. Why will we see improvement in general aviation safety in the future?

First and paramount to this whole matter is harmony of purpose by the entire aviation community. We are beginning to see all segments of general aviation pulling together for a common purpose. This trend will continue because the safety problem itself will become the common bond which will lead to major changes in the years ahead. We are going to see a trend towards increased research on the human being. It is generally recognized that inept or incorrect actions by pilots cause 85 per cent of the accidents. . . .

We are going to see true cause analysis of accidents. By this I mean determining what were the human emotion and behavior factors that contributed to the accident.

We are going to see a total system concept evolve—specifically, a pilot training to understand himself and his behavior in piloting an aircraft which has been delethalized and is simple to fly in a simple airspace system that is free of tension and apprehension and will not make unexpected demands on the human being. For centuries man has been trying to understand himself. Hopefully, in the years ahead, we can educate man concerning his physiological and psychological characteristics which affect safety. This will be a long, gradual process, but we must expand our efforts to educate all airmen concerning human factors.

Recognizing that man is a difficult animal to change, there will be continuing and increasing efforts to improve the vehicle and the environment in which man operates it. We will see in the future vastly simplified aircraft attitude and navigational cockpit displays, widespread recognition and use of automatic safety devices, and development of low-cost ground trainers and simulators. The National Airspace System will be further simplified. Improved weather service will be provided for pilots. The many fine refresher clinics now being offered will be vastly expanded. Aircraft manufacturers will further refine the interior of the aircraft to reduce the possibility of human error. Airport managers and operators will be devoting more effort to safety as general aviation continues to expand rapidly and Government delegates greater responsibility to industry.

Accompanying these optimistic trends will be the heavy demands on manufacturers, schools, airports and facilities as general aviation continues to grow, as greater numbers of airmen make the transition to turbine power and are exposed to a new operational environment. New products, new demands on airmen, and environment changes historically have had an effect on safety. More indirectly, we can expect increasing problems concerning noise, housing near airports and crowded airport conditions. One of the most serious problems facing general aviation today is lack of adequate airports and airport facilities.

In the final analysis, we are confident that the aviation community and Government have the managerial and technical know-how to solve the problems ahead. We are also confident that the flexibility and receptiveness to new ideas manifested by our general aviation leadership will be the key to our future success in aviation safety.

Answer to Aircraft Fires?

Thickened Fuel

Above, inflatable bladder in tank on dolly forces gelled fuel into booster pump, thence to engine. Left, gelled fuel can be picked up by the handful.

This is the fourth in a series of articles on research projects at the FAA's National Aviation Facilities Experimental Center (NAFEC) at Atlantic City, N. J.

A J-47 jet engine was operated successfully on gelled fuel during recent run-up tests at NAFEC to find ways to reduce the aircraft crash fire hazard.

Admittedly a "rough cut" attempt, the research team accomplished what they set out to do—to start a jet engine and operate it at various power levels on gelled fuel.

Basically, the Agency is seeking ways to reduce deaths caused by fire and smoke inhalation in survivable accidents. Proof that fire and smoke inhalation cause many deaths in otherwise survivable accidents is contained in "A Study of United States Air Carrier Accidents Involving Fire" prepared by the Civil Aeronautics Board.

Investigation of these accidents demonstrated that fires usually are caused when highly volatile fuels spill from damaged tanks or ruptured fuel lines and splatter throughout the wreckage where it is ignited by hot engine parts, sparks from impact or the electrical system.

The aircraft fire problem has been approached in a number of ways, including use of break-away fuel tanks, crash resistant fuel systems, fire inerting techniques and solidification of fuels.

Late in 1950, the Army began work on a gelling agent which would rapidly solidify fuel when injected into the tanks just before a crash. Developed for helicopters, because the size and shape of their fuel tanks facilitate rapid gelling, the procedure was not considered practical in commercial planes due to the complexity of the mixing system required for a multitank aircraft. Also, the probability that an aircraft crew could activate the system at the proper time seemed doubtful.

Subsequent experimental work sponsored by the FAA produced a gelling system employing 1.5 per cent by weight of an additive, (N-Coco-Y-hydroxybutyramide—CHBA). This chemical produced a solid modified fuel which had good fire control characteristics and yet met turbine engine fuel requirements when in a liquid state.

Gelled fuel is manufactured by dissolving CHBA in JP-4 standard jet fuel heated to 130 degrees Fahrenheit. When the mixture cools to about 115 degrees, the gel is formed. The chemical resembles flakes of paraffin and has a distinctive kerosene odor. It cools down into a creamy, jelly-like substance.

In flame propagation tests, the gelled fuel shows a fire reduction of 96.7 per cent and a reduction of flame duration by 85.2 per cent.

In drop tests from 40 feet, using 120 gallon auxiliary tanks, the containers filled with ordinary JP-4 ruptured and spewed fuel outward and upward as far as 25 feet. The tanks with gelled fuel broke open slightly, permitting only about a quart of fuel to escape.

During the actual operation of the jet engine on gelled fuel, the thickened fuel was forced from a metal tank 12 feet long and about two feet in diameter by using an air compressor to inflate a bladder inside the cylinder. The makeshift tank was placed under the wing near the number one engine of the B-47 used in the test and the gelled fuel was squeezed into a two-inch flexible hose to a booster pump which forced it into the engine fuel system.

The booster pump broke down the gel particles by about 50 per cent and the engine fuel pump completed the job. The procedure followed in most of the tests was to start the engine on JP-4 liquid jet fuel and operate it from idle to 100 per cent r.p.m. until the engine oil was heated to a stable temperature. When the switch to gelled fuel was made, the engine was accelerated in 10 per cent r.p.m. steps to 100 per cent r.p.m. No difficulties were experienced in getting the engine to respond to throttle demands.

To prevent the gel from solidifying in the lines, the engine was always purged with JP-4 at the conclusion of a day's testing.

Next step in the gelled fuel project is to award two research contracts—one to develop standards to rate various thickened fuels with respect to fire hazards, and the other to investigate the mixture which will perform in a jet engine without extensive modification and yet significantly reduce the fire hazard.

Half

Safe . . .

Get an
IFR
Ticket

In awe of the instrument pilot? A bit envious perhaps? Keep thinking that way and you will also become a lonely airman as well.

The trend in instrument ratings is up. More and more pilots are learning to fly the gauges—and wondering why they didn't start sooner. During the period January-June 1965, FAA issued 5,591 instrument certificates. In the same period last year, 6,437 pilots earned instrument tickets. This represents a jump of 15 per cent.

This is not a hand-picked statistic selected to prove a point. Instrument ratings have shown a steady climb for the past eight years. In 1957 there were 49,170 instrument rated pilots out of 309,212; the score in 1965 (latest year for which total figures are available) was 93,637 IFR pilots out of 479,770. This is a rise from 16 per cent to almost 20 per cent.

What's involved in getting that magic word "instrument" added to your ticket? Actually, not much more than the determination to do so. Stripped of all the mumbo-jumbo, an instrument rating can be earned by the average pilot who takes 40 hours of instrument training, 20 of which may be in a simulator. This, plus 160 hours, making a total of 200, enables the candidate to qualify to take the exam. But a candidate can *start* instrument training at any time—regardless of the number of hours in his log. In fact, FAA's policy is to encourage prospective pilots to use the "integrated system" of instruction while learning to fly. This system teaches the student basic instrument procedures concurrently with visual procedures. New pilots trained under the integrated system receive a Blue Seal affixed to their certificate.

The Blue Seal may also be awarded to veteran pilots. This is an FAA program to acquaint pilots with instrument procedures and start them on their way toward an instrument rating. Under this program, pilots who successfully pass a flight check after completion of a basic instrument training course will be awarded the Blue Seal. There is no written examination. Definitely not an empty gimmick, Blue Seal requirements provide enough training to enable a pilot to extricate himself if suddenly caught in a cloud. Blue Seal details are spelled out in FAR Part 61.

The high cost of instrument training is often cited as the reason why most pilots, as a matter of course, do not get an instrument rating. This is not much of a reason when a little simple arithmetic is applied to the problem. FAA experience shows that the average pilot can qualify for an instrument rating after about 40 hours of instruction. At the rate of $6 an hour for instruction (plus aircraft operation cost) this means that an IFR ticket can be had for as little as $240—a most inexpensive kind of life insurance.

Equipping a plane with appropriate instrumentation and avionics is, admittedly, not exactly cheap. But it is not prohibitively expensive when the cost of the aircraft is considered. The average price tag for most new general aviation aircraft being purchased today is about $15,000, and basic instrumentation and avionics can be had for as little as $1,250. Even less. But the cost of IFR equipment ascends with the owner's desire for more sophisticated equipment such as DME, transponders, autopilot and integrated flight systems.

What about used and rebuilt equipment? Entirely satisfactory if the equipment was rebuilt and inspected in an FAA-approved repair station. After all, all the instrumentation and avionics installed in commercial air carriers and military aircraft eventually become "used and rebuilt" following periodic maintenance.

But what about the pilot who is not a plane owner, or one who knows he will never equip his plane for IFR? Why should he exert himself to get the added rating? The instrument rating adds a new dimension to the man. It gives him an elevated degree of professionalism that a non-IFR pilot never achieves. In a sense, he learns to fly all over again, and he learns something new about himself, as well as his plane.

He acquires a greater appreciation for airspeed and aircraft attitude control and the practical value of precision flying. He sharpens his technique in making instrument approaches, particularly in bad weather.

The subject titles in the instrument flight curriculum provide a thumbnail digest of the training offered. The student is introduced to the "mysteries" of instrument flight planning and filing. He learns how to calculate aircraft performance, range and fuel requirements. The instruments and related equipment are discussed in detail. He learns to fly straight and level—to turn, climb, descend and recover from unusual attitudes using needle, ball and airspeed only. Engine-out procedures, if the test is to be given in a multi-engine airplane, are also included.

The student is introduced to radio navigation, including orientation using low frequency (LF), OMNI range and ADF. He learns how to use the radio as a valuable flight tool and what to do when the radio or instruments malfunction. He gets a new insight into how his body functions and reacts to flight. (See "Disorientation," *FAA Aviation News*, October 1966.)

Many VFR pilots, even those with considerable time, make another discovery when they follow an IFR curriculum—the great variety of flight services offered by the FAA. Many VFR pilots are not aware of AT advisory service, approach control radar service, en route radar traffic service from air route traffic control centers, or the radar approach service available to pilots at major airports throughout the U.S.

Mastery of the gauges builds confidence by dispelling fear of the unknown. In the course of instruction, pilots learn to ask for FAA flight service in the air and on the ground. Some FAA officials are convinced that pilots do not ask for more assistance because they simply do not know what is available and how to go about getting it. Actually, a novice pilot is entitled to just as much service and attention as the captain of a giant air liner. It has been said that the VFR-only pilot limits himself to only a tenth of the service that is coming to him.

Flying at night or in smoke, dust or haze is not considered IFR according to the strict interpretation of the term, but for all practical purposes each of these conditions presents circumstances where instrument flight training is extremely valuable. With air pollution becoming increasingly widespread and night flying increasing, the acquisition of a IFR rating is just common sense.

The switch is on to IFR. In fiscal year 1966 the FAA recorded 745,192 IFR departures for general aviation, a 35 per cent gain over the previous year's 552,509 IFR departures. Ten years ago general aviation IFR departures were a mere 210,046. With the exception of fiscal year 1958, when there was a drop of seven per cent, there has been a steady increase in general aviation IFR departures.

Another indicator of the rapid acceptance of IFR is the generally steady increase in general aviation IFR "overs" (an "over" is the handling of an IFR flight as it passes over an air route traffic control center). There were 226,897 "overs" in fiscal year '66, a 35 per cent increase over 1965 when there were 165,672.

The time is fast approaching when a VFR-only general aviation pilot might ask himself: "Why *don't* I get an IFR rating?" Instead of: "Why *should* I get an IFR rating?"

Pilots flying in the southwestern states encounter a geographic mixture of plains, deserts, coastal regions, mountains and swamps, each of which creates special problems. While the Southwest has crystal-clear skies and some of the most beautiful flying weather in the United States most of the time, it also offers a variety of weather conditions to which the pilot must be alert.

Tied to the Great Plains by "Tornado Alley" (*FAA Aviation News*, November 1966), the Southwest has claim to this belt of tornado activities from near Abilene, Texas, through Oklahoma. Northerly and southerly winds alternately sweep the Texas plains, with an abrupt shift bringing as much as a 50 degree temperature change in a few hours.

To the west of this belt are the desert lands of western Texas and eastern New Mexico and the mountains; to the east are the forested regions of Arkansas, eastern Texas and Louisiana; farther south are the swamps and the coastal regions. This all adds up to pleasant and scenic flying for the VFR pilot most of the year. However, any pilot, either familiar or unfamiliar with flying in the Southwest, should devote some time during preflight briefings to the study of the varied terrain and weather conditions, especially as he plans his flight from one geographical area to the next.

Today's aircraft fly farther, covering greater distances between stops, and inevitably fly into areas of changing weather patterns. Briefings become important for safe flying, even in summer months when there is little apparent need for instrument flying.

Thunderstorm activity becomes most dangerous during March, April and May —and generates many elements including turbulence, tornadoes, hail, icing, gusting and shifting surface winds and rapid pressure changes. Many times there is no way to look at a thunderstorm and judge its intensity—thus the rule: Treat all as dangerous.

In the southern areas of the Great Plains, which are more commonly called the Southern Plains (most of Texas, Oklahoma and the eastern part of New Mexico), weather conditions change abruptly. These unusually sudden changes are caused by air masses of larger weather systems moving through or developing outside the Southern Plains; air masses warmed by the waters of the Gulf of Mexico; hot and dry "continental tropical" air from the northern Mexican deserts and mountains; Pacific Ocean air moving over the Rockies and the cold Canadian air. When these greatly different masses converge and mix, the resulting interaction produces most of the weather hazards encountered by pilots.

Winds from the south and southeast carry the humid air from the Gulf of Mexico northward so rapidly that low stratus clouds and fog develop over extensive areas of South Texas. Ceilings and visibilities drop rapidly below visual flight minimums, and sometimes near zero-zero flight conditions can occur with surface winds of 25 to 30 knots. The northward spread of fog and stratus sometimes is so rapid and extensive that it cannot be forecast. This type of situation, plus strong winds and moderate turbulence, challenges the experienced pilot and presents a hazard to the novice. These conditions prevail with the nighttime cooling and are common as far north as San Antonio and Austin, but dissipate quickly with a warming sun in the morning hours.

Southwesterly winds blowing off the Mexican desert and mountains spread over the western areas of the Southern Plains and at times are laden with thick dust, causing low visibility and moderate-to-severe turbulence. Blowing dust and sand clouds with tops as high as 15,000 feet over western Texas and eastern New Mexico are frequently dense enough to obscure the ground and horizon with in-flight visibilities as low as one-half mile. Neither the low stratus nor dust occurs with every storm system that develops. However, they happen often enough with late spring and fall storms that the pilot should be suspicious of such a condition and be fully briefed on an "escape route" in case of trouble.

During the winter and early spring, warm humid air spreads northward from the Gulf, triggering thunderstorms in low pressure areas and bringing rain or snow across a wide front. Flight hazards near such a storm may include severe-to-extreme turbulence and the possibility of

hail, light-to-moderate icing in clouds and moderate-to-heavy icing in precipitation. Where rain and snow are forming, extensive areas of low ceiling and low visibility may be followed by fog and stratus in the warm, humid air following the storm.

Strong northerly winds may funnel down the high plains west of the storm center and bring severe winter storms with much blowing and drifting snow of blizzard proportions in the Texas Panhandle area. Often these cold winds are referred to colloquially as "blue northers" and are characterized by a very rapid temperature drop. The resultant storms bring the same conditions as the thunderstorms, but, occasionally, with the addition of snow-covered runways and snow drifts on airports in northern Texas and southern Oklahoma. When these infrequent conditions do occur, low surface visibility in drifting and blowing snow may persist for several hours after the snowfall has ended.

As a continuation of the Great Plains, the Southern Plains is also characterized geographically by the gradual upward slope to the mountainous region to the west. This terrain upslope often causes fog and stratus in the wake of a cold frontal passage when easterly winds carry cool and moderately humid air west over the sloping plains. Forming the first night after the frontal passage, the fog will dissipate rapidly the next day if the ground is dry, but if it is saturated from heavy rains the fog could keep visibility below minimums for several days.

The problems of terrain join with those of weather in southwestern Texas to require pilots to be especially alert when flying this area. The 8,751-foot-high Guadalupe Peak, which overlooks the surrounding rugged mountains, lies athwart the airways from the central areas of Texas to El Paso. There are no weather observations except for the Automatic Meteorological Observation System (AMOS) atop Guadalupe Pass. Pilots flying this route are cautioned to ask for in-flight reports on possible weather changes. Generally, the weather reporting stations in the Southern Plains are adequate for proper aviation weather briefing and forecasting.

In the North Central and South Texas areas and in Oklahoma there are abundant landmarks to keep VFR pilots on their proper course. In western Texas and eastern New Mexico an isolated farmhouse may be the only reference for many miles for pilots flying dead reckoning navigation. However, Texas' more than 800 airfields offer emergency landing places, although pilots should be aware that many of these fields do not offer repair and fueling services.

Military bases—most of which are engaged in pilot training—dot the Southwest, indicating a preference for the great expanse of flat terrain for the training of future military pilots. With this in mind, transient pilots should check their charts in preflight planning to learn the location of the restricted training areas.

Northern Arkansas and eastern Oklahoma offer a different type of terrain and weather from most of the Southern Plains. While the southeastern part of Arkansas offers few terrain problems to aviation, rugged mountainous country in other parts of the state can be very hazardous. A pilot should be very familiar with the air routes from Little Rock west and northwest. In this area the Arkansas River divides two east-west ranges of mountains: The Boston Mountains extending from just north of Fort Smith eastward, and the Ouachita Mountains extending from just west of Little Rock westward. Varying elevations at the flight service facilities—Fort Smith, 468 feet, Little Rock, 257 feet, Fayetteville, 1,251 feet, and Harrison, 1,375 feet—must be considered by the pilot when surveying present weather for a VFR flight into this rugged area because terrain in the vicinity of these facilities is higher than the station locations. Some pilots elect to fly up the Arkansas River Valley between Little Rock and Fort Smith rather than to risk a flight over the 2,830-foot mountains when the ceiling is low.

In bad weather a circuitous route is often flown from Little Rock to Fayetteville to avoid elevations as high as 2,700 feet. This mountainous terrain causes turbulence at low altitudes during periods of strong winds. Many lakes and streams in the northwestern part of Arkansas make the area a fisherman's paradise, but a similarity of dams, lakes, streams and terrain makes visual orientation very difficult.

Unbroken miles of forests in eastern Texas and northern Louisiana also test the pilot's visual orientation ability and little relief is found farther south in the bayou country. An emergency landing here would be difficult; it is wise to carry some protective and life-saving equipment aboard the plane. Along the coast seasonal hurricanes have beaten paths inland, but since there are advance warnings, the main danger is to hangared or parked aircraft.

As the pilot flies in the Southwest he will need to remember that the upslope of the terrain means a higher density altitude when he is westbound. Many of the airports in northern and western parts of New Mexico are above 5,000 feet elevation, and special precautions are necessary during hot summer days in allowing for longer takeoff runs and other operational considerations. Pilots flying in this area during the summer months should become familiar with the density altitude charts in their aircraft's operational handbook. (See "Density Altitude," *FAA Aviation News,* July 1966 and "Denalt," *FAA Aviation News,* March 1966.)

Residents of the Southwest are proud of the fact that their area offers beautiful flying weather most of the year, but pilots should not be lulled into a false sense of security. Weather hazards do exist at certain times and places, and a special brand of Southwestern alertness is required because of the quick changing weather patterns. *By George Burlage*

Landing in Downtown N.Y.

Airplanes with short takeoff and landing (STOL) characteristics and helicopters can play a major role in providing relief and emergency services to cities faced with an emergency situation.

This fact was proven to the satisfaction of officials last fall during a two-day exercise in metropolitan New York.

Assuming New York to be a stricken city, nine airlines used regularly scheduled flights to bring in emergency equipment, medical supplies, clothing and Red Cross disaster workers from such places as Chicago, Denver, Miami, San Francisco, Rio de Janeiro, Rome and San Juan. Some of the 50 STOL aircraft and helicopters that participated in the exercise met the airliners at John F. Kennedy International Airport and flew relief cargo and Red Cross personnel to six sites—including three unused piers—in the heart of the nation's largest metropolis. Some 145 Civil Air Patrol aircraft flew into peripheral airports and from there 300 CAP personnel were flown into Manhattan in STOLs and helicopters.

The first STOL landing on Pier 2 was made by Rev. Robert A. Bryan, a chaplain at Choate School, Wallingford, Conn., who spends his vacations as a flying missionary in the bush country of Labrador, Newfoundland and East Quebec. New York's Deputy Commissioner of Marine and Aviation, Herbert B. Halberg, was aboard one STOL flight to Pier 26 that used up only 40 feet of the 900-foot concrete pier. Halberg was not only impressed with the emergency value of landings so near the city center, but also saw immediate commercial benefits as well. He said that he would recommend to Mayor John V. Lindsay that unused piers be made available for commercial STOL operations as soon as possible.

"The possibilities of such facilities are enormous," he said, "and would undoubtedly help considerably to relieve congestion at Kennedy and LaGuardia."

FAA's Eastern Region Director Oscar Bakke, who conceived the idea of the emergency exercise, also saw nonemergency benefits. He said that "city planning for the future should include provision for STOL facilities for every-day normal business and travel needs."

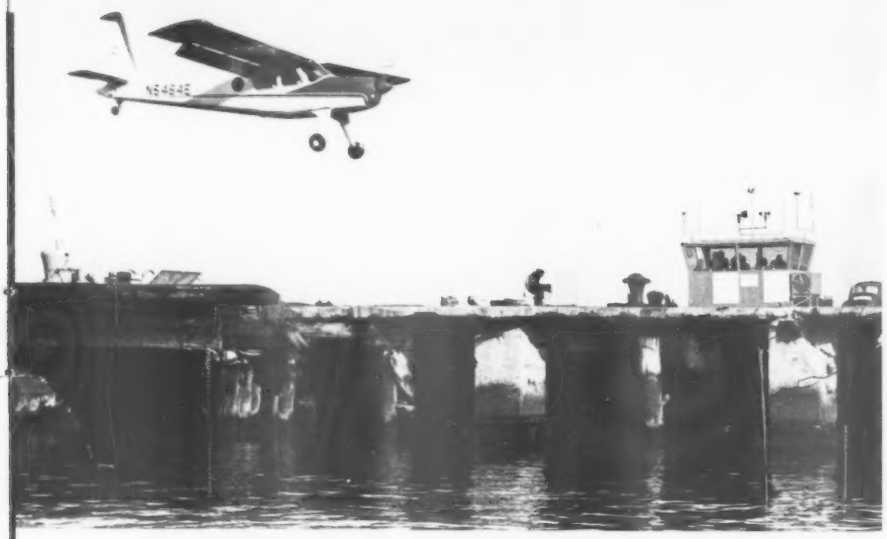
(See page 14 for a story on the possibility of V/STOL aircraft capturing a significant part of the short-haul market.)

Eastern Regional Director of the Office of Emergency Planning (OEP), Albert D. O'Connor, pointed out that "air support to a stricken area proved feasible in Alaska when it was devastated by an earthquake a few years ago, in northern California when floods inundated vast areas and in many regions which had been hit by hurricanes or tornadoes. But never before," he said, "have we set out to demonstrate what could be done by airlift for a city as huge as New York."

The FAA Eastern Region, which sponsored the exercise along with OEP and New York's Department of Marine and Aviation, had a portable control tower airlifted from Kennedy Airport to Governors Island in New York harbor where it was manned by FAA personnel.

A Sikorsky *Skycrane* transported the tower and performed such other Herculean tasks as airlifting a 15,000 pound amphibious "duck" from Brooklyn to Pier 42, a New York Telephone Company communications truck from Brooklyn to East River Park, a Red Cross mobile canteen to Pier 42, a Salvation Army mobile kitchen unit to East River Park and a five-ton truck fully loaded with medical supplies for Bellevue Hospital to Pier 26. Other helicopters and STOL aircraft also carried several thousand pounds of mail to Manhattan from various outlying districts and portable generators, medical supplies, fuel, food and clothing to Piers 26 and 42, East River Park and South Street from Brooklyn, Long Island, New Jersey and upstate New York.

Chinook brings in emergency supplies for "stricken" city dwellers.



Helio **Courier II**, a six-place light STOL, about to land on an unused pier in downtown Manhattan.

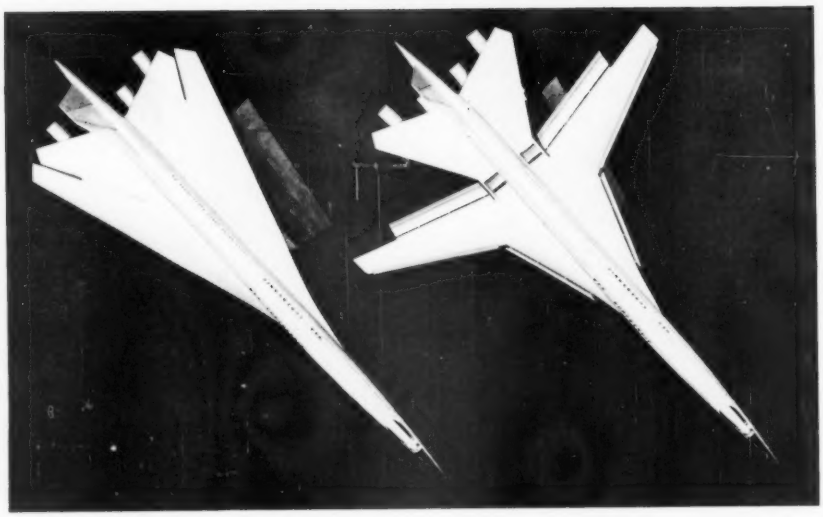
Air traffic on Pier 26 was controlled from this self-contained portable FAA control tower.

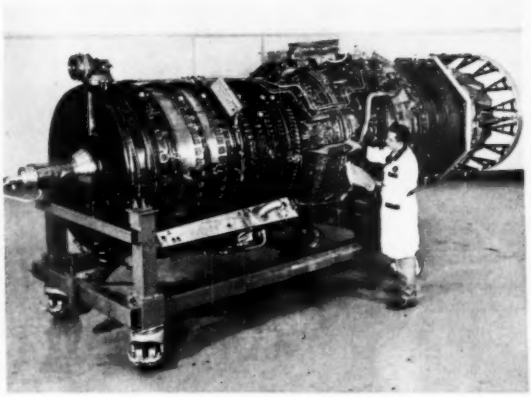
Skycrane moved trucks, "ducks" and tower to midcity sites.

Grim realism of the exercise shows on faces of nurses.

Airliners flew in Red Cross workers from other cities.

Boeing, GE Win SST DESIGN COMPETITION





The Boeing SST variable-sweep design, above, is to be powered by General Electric's GE4 turbojet. The GE4 test engine, left, is 6 feet in diameter, 25 feet long. The engine is to have a thrust of 62,300 pounds.

The Boeing Company and The General Electric Company were named as the winners of the FAA supersonic transport design competition. The selection culminated an intensive 30-month competition between The Boeing Company and the Lockheed Aircraft Corp. for the airframe, and The General Electric Company and the Pratt & Whitney Division of the United Aircraft Corp. for the engine. All four manufacturers have been working under Government cost-sharing design contracts since June 1964.

In announcing the decision Dec. 31, FAA Administrator William F. McKee pointed out that the selection was supported by a comprehensive Government evaluation and by the majority of the major U. S. airlines as well as by independent technical analyses.

No decision has been made as to whether to proceed into the next phase of the supersonic transport program, which is prototype construction and testing. Pending that decision, the administrator said the Boeing and General Electric contracts will be extended on a month-to-month basis. During the period of contract extension, the contractors will continue to perform development, testing and design refinement and the FAA will continue to explore certain economic aspects of the program.

Variable-Sweep Wing

The Boeing SST design features a variable-sweep wing. With the wing swept 30 degrees, the 675,000-pound SST will be able to take off fully loaded at 186 miles an hour in only 6,800 feet of runway, approximately the same speed and in less runway than a fully loaded Boeing 707 requires. Its landing approach speed with the wing at 20 degrees sweep also will be about the same as the 707 International—146 miles an hour with a 5,800-foot landing field requirement.

Slotted trailing-edge flaps and leading-edge slats along 85 per cent of the extended wing will produce added lift for takeoff and landing. This will make it possible for the SST to climb rapidly after short-field takeoffs and to approach for landing at low engine-power settings with its fuselage in the same attitude as today's jet airliners.

Noise Reduced

In addition to its ability to climb quickly after takeoff and approach for landings at low power, both of which will insure low sound levels at airport communities, the SST will incorporate another noise-reduction feature: The airplane's four engines mounted under its large horizontal tail will be fitted with variable-geometry inlets that can choke out the high-pitched sound from the engine compressors during airport approaches.

When subsonic flight is necessary, the SST's wing will be swept at an intermediate angle between takeoff and supersonic cruise settings. With the wing in this position, the airliner will cruise efficiently at speeds equal to those of the fastest subsonic jet airliners. The wing will be swept 72 degrees for efficient supersonic flight.

The SST structure will be built primarily of Ti6Al-4V, a titanium alloy of 90 per cent titanium, 6 per cent aluminum and 4 per cent vanadium.

The airplane will carry more than 300 passengers in a cabin which features double aisles and seven-abreast seating.

Semi-Automatic Pilot Seen as Boon to Noninstrument Rated

An experimental "poor man's autopilot" recently evaluated for the FAA by Cornell Aeronautical Laboratory, Inc., might hold the key to accidents attributed to disorientation.

The device, called Stability Augmentation System (SAS), is intended for noninstrument rated pilots flying light planes. Basic components are a tilted rate gyro which responds to the roll and yaw of the craft and a pitot sensor for airspeed computation.

In the system, roll-yaw control or pitch control can be combined or used independently. They can be switched on or off by the pilot or they can be used in a stand-by mode. in which case they are activated when predetermined limits are exceeded.

In a series of evaluation flights, 26 noninstrument-rated subject pilots were required to make a VFR cross-country flight in which they were unexpectedly faced with simulated weather conditions. It was determined through the safety pilot's observations and a data-recording camera that noninstrument-rated pilots flew as well in instrument weather with the assistance of SAS, as they did in clear weather without it. Without the help of SAS, nine of the pilots lost control of the airplane at some point in the flight, but with SAS turned on, no pilots lost control at any time.

Five instrument-rated pilots also were tested to obtain their opinions of SAS. All of them performed a more accurate ILS approach with the SAS on than without it.

Pilot comments on SAS were extremely favorable, even among the instrument-rated pilots who felt that the SAS cut down their workload.

The device used in the tests was made by Tactair Fluid Controls Corp., Bridgeport, Pa., under contract with the FAA.

Several manufacturers recently have begun to produce similar systems. One major aircraft manufacturer has been installing a similar system, but using the roll-yaw axes only, in all new production airplanes. Other airplane manufacturers offer similar systems as optional equipment for several hundred dollars, a fraction of the cost of the automatic pilots used in air carrier or executive aircraft.

Although the aircraft industry has generally acknowledged the usefulness of the light plane stability augmentation systems concept, the exact degree had not previously been determined.

New Instrument Flight Procedures Handbook Out

A new handbook containing standards to be used in setting up or revising the instrument flight procedures used by pilots landing at all U.S. civilian or military airports has been published by the FAA.

The new procedures, which afford improved service through additional instrument approach capability and lower weather limits for landings at more airports, are applicable wherever FAA or the U.S. Armed Forces exercise jurisdiction over flight procedures in terminal areas.

Taking advantage of recent technological advances, the new handbook provides for more efficient use of both ground-based and airborne navigation equipment to meet the demands of increasing traffic volume. Moreover, it gives airport planners greater flexibility in designing instrument flight procedures for today's aircraft which have a greater range in size, weight, speed and maneuverability. In some instances, airports will be able to make use of navigation aids which previously could not have been used.

The FAA Handbook, titled *United States Standard for Terminal Instrument Procedures*, replaces the former *U.S. Manual of Criteria for Standard Instrument Approach Procedures*. It can be obtained without charge from the FAA, HQ-438, Washington, D. C. 20553, with a self-addressed mailing label.

'Flying Rebels' Race, Hold Fly-Ins, Stress Safety

"Rebels" planning future flights are, from the left, John S. MacFerran, Rex Walker and Paul Potter.

A 600-mile handicap race is the annual highlight event of the Flying Rebels, the largest and most active flying group in Georgia and one of the largest in the nation. The race provides members with "a competitive measure of individual capabilities" to get the best possible performance from each type of general aviation aircraft participating.

According to the organization's regulations, entrants are disqualified if they do not comply with all safety rules. The event is "designed to promote and demonstrate the safety, utility and efficiency inherent in personal flying."

Members of the Flying Rebels own more than 100 aircraft and they log more flying hours for business than for pleasure. But they take time for fun too with about five trips and fly-ins a year.

Bill Browning, above, was the first winner of the Rebel "600." Eric Moser was the 1966 winner.

BRIEFS

• SMOKEY THE BEAR has a new plane in his aerial firefighting armada. The Snow Commander, an agricultural aircraft, salvoed its load of 300 gallons of water to douse a blaze during a recent firefighting demonstration at Dulles International Airport. Foresters see a major advantage in using a plane of this type for fire watch on timber patrol as it can cruise large areas while staying aloft for four or more hours. The Commander can be used to de-ice airport runways and long stretches of icy highways in minutes. It can also be used for mosquito control and defoliation. The rugged plane weighs 6,000 pounds, has a span of 44 feet, six inches and can cruise 470 miles at 50 per cent power. Top speed is 140 m.p.h. The working speed is 95 to 110 m.p.h. Takeoff distance is 850 feet and the Commander can land in 500 feet at its full gross load.

• CREDIT WHERE CREDIT IS DUE. The FAA is considering amending Part 61 of the Federal Aviation Regulations to permit student credit for training received under U. S. military instructors and foreign ICAO membernation instructors. The Agency is also considering amending FAR 61.115(a) to require an applicant for a commercial pilot certificate to have, as part of the required 200 flight hours, 10 hours of instrument instruction and 10 additional hours special flight instruction.

• NEW PUBLICATIONS available are Gyroplane Flight Instructor Examination Guide, AC 61-33, which defines the basic knowledge required for a flight instructor certificate; Gyroplane Pilot Examination Guide—Private and Commercial, AC 61-31, written to assist applicants preparing for private or commercial gyroplane written examinations; Practice Guide for Aircraft Decontamination, AC 20-48, designed for use by industry emergency readiness teams or other groups organizing or conducting practice exercises in radiation decontamination. The above may be obtained free of charge by writing to FAA, HQ-438, Washington, D. C. 20553, enclosing a self-addressed mailing label.

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402 are U. S. Civil Aircraft Register, AC 20-6F, $6.50; Instrument Flight Instructor Written Examination Guide, 50 cents.

• UNMANNED BALLOONS. The FAA is considering a regulation to protect aircraft from runaway or abandoned balloons by requiring balloons to have additional self-destruction devices, plus equipment to make it possible for FAA to track them by ground radar.

Report Sees V/STOLS Taking 40% of Short-Haul Market

About 40 per cent of the future short-haul air travel market could be "captured" by V/STOL (vertical and/or short takeoff and landing) aircraft, according to a study prepared for the FAA by the McDonnel Aircraft Corp., St. Louis.

Described in the report is a new family of 100-passenger aircraft operating from small airports close to downtown areas.

The report found that travelers in the area selected for the study—the 500-mile long north-south "California Corridor" stretching from San Diego to Los Angeles, San Francisco and Sacramento —would save $7 million worth of time annually by flying V/STOL instead of conventional planes.

The V/STOL fare for a 350-mile trip would be about $1.60 more than a conventional jet ride for the same distance, but the increased cost would be more than offset by the advantages of speed and convenience, according to the study. Higher over-all operating costs of V/STOL travel are attributed to complex maintenance and operational requirements, plus the construction costs of special V/STOL airport facilities.

FAA, as chairman of the Government Task Force on Interurban Air Transportation, has been studying the technical feasibility and economic potential of V/STOLs for airline service in high density areas and their compatibility with future air traffic control, air navigation and airport facilities.

The report, in three volumes, can be purchased from Clearinghouse for Federal, Scientific and Technical Information, U. S. Department of Commerce, Springfield, Va. 22155—Vol. I (Final Report), AD 641 506, $2; Vol. II, AD 641 507, $5; Vol. III, AD 641 508, $5.

Bird Hazard Circular Available

The flight paths of migratory birds, where they are most likely to be encountered and when the flights are at their peak are demonstrated in text and chart in a recently released FAA advisory circular, "Bird Hazards to Aircraft."

The pamphlet is part of the FAA's continuing campaign to reduce bird strikes which cause millions of dollars each year in structural and engine repair costs.

Free copies of the circular, AC 150/520-3, may be had by writing to FAA, HQ-438, Washington, D. C. 20553, enclosing a self-addressed mailing label.

• Export of Aircraft

A friend and I are considering purchasing several B-26s to be converted for agricultural purposes for the application of spray fertilizer, etc. We intend to use these planes in Australia. We would own and operate the aircraft. Are there any Federal restrictions prohibiting shipment of these aircraft from the U.S.?

Name withheld

There are no Federal Aviation Regulations which would prohibit the shipment of aircraft such as you describe in your letter. However, you would have to obtain a license from the Office of Munition Control (U.S. Department of State, 2121 Pennsylvania Ave., N.W., Washington, D.C. 20520), to take a military aircraft or a converted military aircraft out of the country.

• Transponder Equipped?

After several years of having air traffic controllers ask me "are you transponder equipped?" I finally had a very fine Bendix transponder installed. On a recent coast-to-coast trip I had all kinds of help and assistance from centers from Indianapolis straight down to Los Angeles and back—until I got within 50 miles of Washington National Airport, my home base. On a legally VFR day with scattered clouds, I called Washington Center at 3,500 feet and was advised "108 Whisky Pop, radar service terminated." Upon inquiring the reason, I was advised that IFR traffic requirements were too high to handle me.

In view of the fact that traffic separation is supposed to be the reason for having a transponder in the first place, why could I not continue to have squawked some code the operators were working, even though they didn't talk to me, as long as they knew my altitude and position from prior transmission? Every time I am told "radar service terminated" or "squawk stand-by" I wonder why anyone asks me "are you transponder equipped?" in the first place.

Washington, D.C.

VFR traffic advisory service is an extra FAA service; the controller has complete discretion for determining whether he is able to provide this service in any specific case. Many factors—such as volume of traffic, controller workload and communications frequency congestion—may prevent the controller from providing this service. It is necessary, therefore, at times to report that radar service has been terminated. But this information should not be construed to mean that you should turn off your transponder. If you have been squawking 0600, you should continue to do so. If the controller had you squawking some other code when you are being provided radar service, you should return to the VFR code 0600 or code 0700, if appropriate, upon receipt of the information "radar service terminated."

You will find the code employment plan for visual flight rules on page 1-64 of the current Airman's Information Manual. *These codes are monitored by the controller where applicable. The controller is obligated to issue control clearances and, when conditions permit, traffic information to all IFR aircraft under radar control. When not being directly provided with radar advisory service, VFR flights squawking the proper code do accrue benefits as a product of the service being provided IFR aircraft.*

• Soldier Wants Wings

I am interested in furthering my flight education . . . (but) I have one major block—lack of funds. I am in the Army which does not allow for too much expression of the pocketbook. I am willing to work for the lessons, but with the odd hours I have employment is hard to find. I will be in the Washington area until my discharge in '69. I will be grateful for any information or leads toward continuance of my flight instruction.

Washington, D.C.

The U.S. Office of Education makes available low interest loans for flight training through local financial institutions. For information we suggest you contact the Guarantee Agencies Section, Division of Student Financial Aid, Office of Education, Washington, D.C. 20202. The telephone number is (202) 962-6804.

It is possible that the operator of some local airport may be interested in offering flight instruction in return for your service as line serviceman, helper, office attendant or in some other job for which you may be qualified.

• Seeks Link Lore

Please inform me of periodicals, pamphlets or regulations governing operation of a Link trainer, instrument (ground type) flight trainer or flight simulator. I am interested in opening a department for instrument training.

Phoenix

We do not have any pamphlets which apply to the use of flight simulators; however, parts 61 and 141 of the FARs and Advisory Circulars 61-8 and 143-2, which you now have, will be helpful. The regulations in sections 61.35 and 141.65 show the number of instrument hours that can be acquired in synthetic trainers. The two advisory circulars may be of assistance in that they are examination guides for instrument ratings. All publications are sold by the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402—FAR Part 61, 50¢; FAR Part 141, 25¢; AC 61-8, 40¢; and AC 143-2, 50¢. For further assistance, we suggest you contact the FAA General Aviation District Office, Sky Harbor Airport, in Phoenix.

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

• Publications? CO, et al

I am very much interested in obtaining one of those carbon monoxide indicators described on page 4 of the November issue of *FAA Aviation News*. Can you advise me where I might be able to obtain one?

Also, I think it would be a convenience to many readers if you would specify whether FAA reports, bulletins, advisory circulars, etc., are free of charge and, if not, I think that the cost should be stated.

Would you please send me copies of the three FAA Aircraft Development Service (ADS) reports mentioned in the carbon monoxide article.

Brooklyn

The "Detector" carbon monoxide indicator can be purchased from aircraft accessory retailers at various airports. We have the address of three outlets that sell them for $1 postpaid—Intra-Port, Ltd., Box 68, Allenburst, N.J. 07711, Scot Air, Inc., 6451 Main St., Morton Grove, Ill. 60053, and Van Dusen Aircraft Supplies, Teterboro Airport, Teterboro, N.J. 07608.

Usually FAA Aviation News *does indicate where publications may be obtained and when there is a charge, the charge is indicated. Here's the way it works: All FAA publications are free when available directly from the FAA—write to FAA, (Attn: HQ-438, for advisory circulars and HQ-630 for reports) Washington, D.C. 20553, and enclose a self-addressed mailing label.*

Most FAA sale publications are available from the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.

In some instances, such as in the case of the ADS reports, the FAA prints a limited number for general distribution. Sometimes, when this free supply is exhausted (as it is now with ADS-28, ADS-29, and ADS-30), copies may be purchased from the Clearinghouse for Federal Scientific and Technical Information, 5285 Port Royal Rd., Springfield, Va. 22151. Here is the information you need to order them:

—FAA Technical Report ADS-28, "Metalurgical Evaluation of Failed Aircraft Stainless Steel Exhaust System Components," Document No. AD614913, $3.

—FAA Technical Report ADS-29, "An Analysis of Engine Exhaust System Failure in General Aviation Aircraft," Document No. AD 612949, $2.

—FAA Technical Report ADS-80, "Evaluation of Low-Cost Carbon Monoxide Indicators," Document No. AD 461670, $2.

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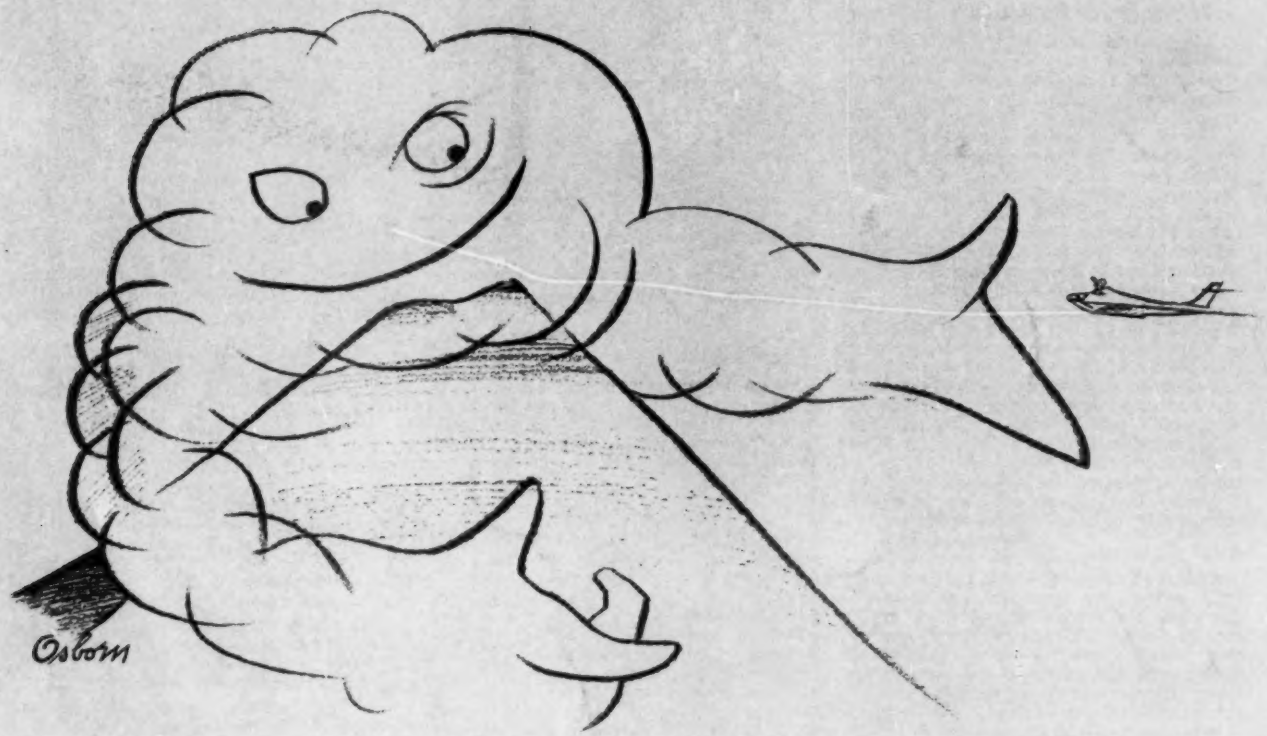
FFICE

Beware the lure of fleecy clouds;



There may be rocks beneath their shrouds.